adhesions.[1] When the abscess fails to cicatrize after rupture the indications for treatment become, of course, identical with those of the chronic discharging abscess.

The chief results of our inquiry may be summarized as follows:

1. Closed pulmonary abscesses are abscesses of the connective tissue, of which the most favorable and most common form is the subpleural abscess.

2. The subpleural abscess may attain a large size without causing a corresponding destruction of pulmonary tissue; for the individual pulmonary lobules, isolated by the suppurative process, retract before the pus in a manner analogous to the retraction of the lung as a whole in the presence of pleural effusion.

3. The frequency of the occurrence of subpleural abscess is probably greater than is commonly supposed; for this abscess simulates empyema so closely that it is generally mistaken for that disease.

4. The only trustworthy means of distinction between these two diseases is probably the microscopic examination of pus withdrawn by aspiration previous to rupture.

HYDATIDS OF THE LIVER.

By Jacob Frank, M.D.,
SURGEON TO COOK COUNTY AND ST. ELIZABETH HOSPITALS, CHICAGO.

The literature on this subject is very extensive from the eighteenth century on, and it is a noteworthy fact that more than 50 per cent. of all cases recorded occurred in the liver. Dr. Alexander Hugh Ferguson, of Winnipeg, has probably seen more cases of this kind than any other surgeon in America. Prof. William Osler, of Baltimore, in his late valuable work of 1894, claims to have gathered the literature of only 85 cases in the United States.

Etiology and Pathology. The parasite that causes this trouble is known as the tænia echinococcus. The mature tænia is a small tapeworm, one-quarter of an inch long, and inhabits the intestinal canal of dogs, jackals, and wolves. It has four segments, the last of which is as long as the other three combined. The head has a pointed beak, with a fringe of thirty to forty hooklets at its base, and four suckers. It has a vascular system running down each side of the body.

The ova of this worm are introduced into the alimentary canal with the food, but more commonly with the drinking-water. The embryo emerges from its shell and makes its way into the surrounding tissues, and may often be carried along in the blood-current as an embolus until it finds a resting-place in the lung, liver, kidney, thyroid gland, breast, heart, vermiform appendix, subperitoneal tissue, connective tissue of the trunk and limbs, the omentum, the medulla of the bones, spinal cord, or the brain. In the brain the cerebrum seems to be the most frequent seat of the cyst, the right lobe being affected oftener than the left. After reaching its destination it gradually develops into a hydatid cyst.

---

[1] See also Godlee, Lancet, vol. i., 1887, p. 457, and Coupland, British Medical Journal, vol. ii., 1885, p. 427.

The scolices or heads are formed in brood-capsules. These scolices are directly continuous with each other by means of the parenchyma of the main and daughter-cysts. The walls of the hydatids consist of two layers, an outer cuticular or ectocyst or chitinous layer, and an inner or parenchymatous or endocyst layer. The cuticular layer is very elastic, and curls inward when divided. The parenchyma consists of granular matter, cells, and muscle-fibre.

The scolices are seen projecting from this parenchyma as small, wart-like bodies, and are frequently in groups of four or more attached to a common stem. They measure about 3 mm. in length and have four suckers and a fringe of hooklets, the same as the adults. These hooklets often become detached, and during a tapping of the cyst are withdrawn, and this forms the pathognomonic sign of hydatids. The fluid is non-albuminous, of low specific gravity, 1000 to 1010, and, as a rule, is clear, though at times it may be bile-stained.

The brood-capsules are developed from the parenchyma, and also have two layers, the outer one being the parenchymatous layer of the mother-cyst, and the inner one being the cuticular layer. It will be seen from this that the order of layers is reversed in the brood-capsules from that of the mother-cyst.

The daughter cysts may develop cysts of their own, and these are termed granddaughter-cysts or endogenous daughter cysts. Where this process takes place the mother-cyst, as a rule, is very large and may contain thousands of daughter-cysts. Some echinococci-cysts do not develop brood-capsules, and still attain great dimensions; these are termed sterile cysts.

The presence of the cyst irritates the surrounding structure and gives rise to the formation of a thick fibrous sheath or capsule, which at times is very vascular.

An interesting question in considering the pathology of this disease is, What becomes of the liver-tissue where large cysts develop in this organ? Some authors believe that an atrophy takes place, others are of the opinion that a hypertrophy take place; but it is my firm belief that the liver-tissue is never destroyed to any physiological extent unless there be an inflammatory exudate as a result of long-continued pressure in the liver, for if there was, how could it be possible to record such rapid improvement in these cases as is the general rule. I believe that by the slow growth of the cyst within the liver this organ gradually becomes compressed as a lung would be by pleural effusion.

If the cyst grows to a sufficient size, there will be interference with the physiological functions of the liver; but on tapping or opening these cysts the liver immediately expands and resumes its normal functions, as a lung does on being relieved of the presence of a pleural effusion. The thick connective-tissue capsule must also have some formation, and I believe it is formed from liver-tissue, due to the inflammatory exudate, as a result of pressure, forming a fibrous capsule, this capsule being the liver's protection.

The symptoms of hydatids of the liver vary, depending upon the size and location of the same. When sufficiently large and near to the surface they may be felt as globular tumors, of a firm and resisting tendency, and yet slightly elastic; in some cases fluctuation can be determined, according to the amount of fluid present.

The tumor may be situated behind the liver, and in cases of this kind, where it does not grow to a large size, may give rise to no external manifestations. In other cases, in which the tumor is situated posteriorly, as it grows it pushes the liver before it: hence there are a flattening and downward protrusion of this gland, with a corresponding increase of hepatic dulness.

As the cyst grows we have our attention called to pressure-symptoms. The patient may feel the tumor, or complain of a dragging sensation, or, as some explain it, as though there was a weight attached to the liver. There may be dyspnœa and a dry cough as a result of the upward growth of the cyst toward the diaphragm; we may also find an explanation for palpitation by the displacement of the heart by the tumor. The stomach may also be interfered with, and we have as a result vomiting, different gastric symptoms, and emaciation.

When the portal vein or vena cava is pressed upon we look for ascites, jaundice, and hemorrhoids. Absence of bile in the feces may be due to direct pressure of the hydatid upon the bile-ducts. An acute pleurisy may be due to rupture of a hydatid into the pleural cavity. Peritonitis results from the emptying of the cyst into the peritoneal cavity.

DIAGNOSIS. This is really difficult, if not impossible, in the early onset of the disease, as some patients retain good health for years, and even die at an advanced age from some other trouble, without being aware of the fact that they are subjects of this disorder. *This also shows that there can be little if any physiological destruction of the liver.*

DIFFERENTIAL DIAGNOSIS. It is sometimes possible to differentiate hydatids from cancer of the liver, abscess, enlarged gall-bladder, aneurism, pleurisy, and cysts of the right kidney.

In cancer of the liver we have an irregular surface and border, pain, rapid progress of the disease, and the well-marked cachectic appearance of the patient. In abscess of the liver there will be local pain, with a history of rigors, hectic fever, and very likely antecedent attacks of dysentery. It is well to mention here that hydatids sometimes suppurate, but the constitutional symptoms are not so severe as in abscess.

A hydatid cyst may frequently be mistaken for an enlarged gallbladder, but the pyriform shape of this organ, with the history of biliary colic and jaundice, should be remembered in making a differential diagnosis.

An abdominal aneurism will pulsate and give the bruit along the course of the aorta. To differentiate hydatids from pleural effusion of the right lower chest, we observe the following points: In pleurisy the fluid will change with the change of position of the patient, and the liver is not necessarily enlarged, while in hydatids the fluid is stationary and the liver almost always enlarged.

In cysts of the right kidney we will obtain a history of the tumor starting below and growing upward, while the reverse holds good in hydatids of the liver. In the former we have tympanitic percussion due to the colon, while in the latter there is always dulness.

RESULTS OF HYDATIDS. Hydatids of the liver may cause no trouble whatever or they may result in the following:

1. By pressure interfering with the functions of some organs of the body, and by attaining a large size, causing ascites and dropsy.

2. Forming adhesions with the diaphragm and ulcerating through, either into the pleura, causing pleuritis, or further ulceration may take place in the lung, and the contents, coming originally from the liver, may by this channel be expectorated and lead to a spontaneous cure.

3. A fistulous opening may be formed into the lumen of the bowel and lead to a cure.

4. If they open into the stomach and the fluids and cysts be vomited, a cure is the result.

5. If a simple cyst ruptures into the kidney or bladder, a spontaneous cure is possible.

6. If they empty into the pericardium, the peritoneal cavity, bile-ducts, or gall-bladder, the result is disastrous.

7. Cases are on record in which hydatids have invaded the trachea and produced death by suffocation.

8. Nature's best cure, without any surgical aid, is the formation of adhesions to the parietes. Cases are on record which have emptied themselves externally, but this favorable result is not often met with.

9. Finally, a calcareous degeneration may take place within the cyst, and thus lead to a very satisfactory termination.

Case I.—Family history negative. Patient's history: female, aged thirty-two years; Russian; height, 5 feet7 inches; weight, 120 pounds. Was always in good health up to her twenty-fourth year, that is, eight years ago, when she noticed a hardness and fulness in the right hepatic region. Her bowels at this time were regular, appetite good, and she had no pain or fever. She continued in good health up to a year before the operation, when she complained of pain and had fever and loss of appetite. In the intervening seven years she noticed that the mass in the right side grew very slowly. She never was jaundiced and never was closely associated with dogs.

I saw the patient for the first time on October 3, 1893, at the St. Elizabeth Hospital, and after a careful examination advised operation, my diagnosis being cyst of the gall-bladder due to an inflammatory obstruction of the common duct.

On October 10th, with the assistance of Drs. Luken, Kunz, and Wittwer, a vertical incision was made over the most prominent portion of the mass to the cyst. There being no adhesion to the parietal peritoneum, the finger was introduced, and the tumor found to be adherent to the omentum, the intestines, and to the under surface of the liver. An aspirator was introduced into the cyst and the characteristic fluid withdrawn. I immediately knew that I was not dealing with a cyst of the gall-bladder. The fluid commenced to ooze out after the withdrawal of the needle. A sponge was placed over the puncture and several other sponges were packed around the mass, so as to close off the abdominal cavity. The patient was then turned on her right side and with a knife the sac was freely opened, and as the cyst-wall became more lax forceps were attached to the margins of the cyst and the sac pulled out and emptied. It was then irrigated, the sponges removed and thrown away. The peritoneum was then sewed around the cyst-wall by a continuous suture, and two inches of the sac were removed. A large-size rubber tube was introduced, besides gauze-packing. The wound was dressed and the patient put to bed. The wound was dressed daily. A week after the operation large quantities of bile began to discharge, and continued to do so for two weeks. It was about three months before the entire cyst-wall contracted down and the fistulous opening became closed. The cyst in this case was about the size of a small fœtal head. It grew from the under surface of the liver, and instead of protruding outward grew downward, and thus formed adhesions to the intestine and omentum. She had no rise of temperature at any time after the operation.

I saw the patient on November 10, 1894, at which time she was in good health, but complained of pain at the site of the operation, which is due to a ventral hernia, the patient having failed to follow instructions and wear a supporter, as she was told to do.

Case II.—Family history negative. Patient's history: male, aged twenty-eight years; German; married; height, 5 feet 5 inches; weight, 120 pounds. Always had dogs about him. Nothing worthy of mention occurred for twenty years; at this time he was taken ill suddenly, with a severe pain in the right side in the region of the gall-bladder. He was ill for four and a half weeks, but did not know what ailed him or what he was being treated for. For the following five years he had occasional attacks of pain in the right side, but aside from this was perfectly well, his appetite remaining good, bowels regular, and he slept well. Three years ago he was sick for four weeks with an attack of typhoid fever. Recovering from this, he was in good health up to September 1, 1894, when he was again taken with a pain in the right hepatic region. He had a chill, followed by a temperature of 103.5° F.; he rapidly became jaundiced, and his physician informed him that he had gall-stones. During the following two weeks he suffered much pain and vomited bile-colored material.

On September 25th I was called to see the case through the kindness of my friend, Dr. Landis, and found the following conditions: A not well-marked hardness was felt at the supposed lower border of the liver, in the region of the gall-bladder; percussion gave dulness to a limited painful area the size of a fifty-cent piece. The patient was jaundiced to saturation, had an anxious, pinched look, and was very much emaciated. He had a temperature of 103° F., and a small thready pulse of 120. Although the hardness seemed a trifle high to be situated in the gall-bladder, I also was led to believe that I was dealing with a case of biliary calculus.

The operation was performed the same afternoon. With my assistant, Dr. Kunz, and in the presence of Drs. Landis and Chapman, an oblique incision was made over the region of dulness, two inches below the costal cartilages, through the peritoneum. A tense, white surface was brought into view, and my first thought was of abscess of the liver. The gall-bladder was examined, and being found empty I next proceeded to a more minute examination of the whitened surface. Sweeping my finger around this plane I discovered that adhesions had slightly formed in two places. I next sewed the peritoneum around the liver-border of the shining mass, and thus completed what Nature would have finished in a short time had the patient lived long enough without surgical interference. I now had to deal with a circular surface about the size of a silver dollar closed off from the abdominal cavity. Sponges were packed around the edges and the aspirating-needle introduced. A clear fluid was withdrawn, and my diagnosis was changed to that of hydatid of the liver. The needle was withdrawn and gauze packed over the puncture, which in this case gave rise to no leakage. The wound was dressed in the ordinary manner and the patient put to bed. His temperature dropped to normal, and four days later, the adhesions having become firm, a large opening was made through the centre of the white mass and hundreds of cysts immediately popped out. The cyst-cavity was thoroughly irrigated with sterilized water and the inner surface gently curetted with a dull curette, the object being to loosen the daughter-cysts from their parenchymatous attachment. A large-sized rubber drainage-tube was introduced and the wound again dressed. Several days later bile was discharged in large quantities and continued to discharge for a week. The jaundice disappeared and the fistulous opening soon contracted.

The patient, November 19, 1894, feels perfectly well and is attending to his duties, which are those of a teamster. He has gained twenty-six pounds since the operation.

In regard to the treatment of hydatids of the liver little more need be said than that which I have already brought out in the treatment of my two cases. For general rules, I think the following will be found applicable in the majority of cases:

1. An incision over the most prominent portion of the presenting mass, be this high or low; or, if no tumor can be discovered, the area of hardening and increasing dulness should be our guide for incision.
2. Examine for adhesions: if they be complete, our work is simplified; if not, we must sew the peritoneum all around the mass so as to shut off the abdominal cavity.
3. Introduction of the aspirator. This needs no explanation; but it is well to bear in mind that we do not always obtain the characteristic fluid, as at times the fluid may be too consistent to enter the needle.
4. We must wait for three, four, or five days for adhesions to become firm, before opening the cyst.
5. When the cyst is opened a large opening should be made and the largest size rubber-drain introduced.
6. The dressings must be made under strict antiseptic precautions, as there is a possible danger of secondary infection.
7. The cyst-cavity should be washed out with sterilized water for the first week, after this with carbolic solution, iodine solution, peroxide of hydrogen, boric acid, creosote, or any of the antiseptic solutions.

The point on which there has been more diversity of opinion than any other is: Where there are no adhesions should the operation be made in one or two sittings? Most authors advise two operations, claiming that there is too much danger of allowing the hydatid fluid to enter into the peritoneal cavity, which would perhaps result fatally, or it might form a nucleus for another cyst.

With care an operation of this kind can be performed in one sitting, as my first case will show; but the best plan is, if time will permit, first to sew the peritoneum to the sac and wait four or five days for the adhesions to become firm, as was done in my second case.

PROGRESSIVE MUSCULAR DYSTROPHY,

WITH SPECIAL REFERENCE TO IMPROVEMENT BY TREATMENT.

BY ALFRED WIENER, M D.,
LECTURER ON MENTAL AND NERVOUS DISEASES IN THE NEW YORK POLYCLINIC;
NEUROLOGIST TO THE MT. SINAI HOSPITAL DISPENSARY.

BEFORE proceeding to the report of my own case, a short review of recent contributions to the many mooted questions regarding progressive muscular dystrophies will not prove uninteresting to the reader.

As a result of this subject, which was carried on for many years by Duchenne, Aran, Charcot-Leyden, Friedreich, and Lichtheim, there were finally created two divisions of progressive muscular atrophy—a spinal form and a primary myopathic form, including the pseudo-hypertrophic